EFFECT OF STRUCTURED RESISTANCE TRAINING AND WEIGHT TRAINING ON AGILITY AND BREATH HOLD TIME AMONG BASKETBALL PLAYERS

Dr.N.Arunkumar

Assistant Professor in Physical Education,Vasireddy Venkatadry Institute of technology Guntur.Andhra Pradesh, India, arun.nutalapati009@gmail.com

Vallem subramanyam

Academic consultant

Department of physical education, Sri Padmavathi Mahila Visva Vidyaalayam, Tirupat, Andhra Pradesh, India, subbuvallem4@gmail.com

Dr.Sathuluri Raju

Assistant Physical Director, Chaitanya Bharathi Institute of Technology, Hyderabad,Telangana, India, sraju_ped@cbit.ac.in

ABSTRACT

The Present study find out the assess the effect of structured resistance training and weight training on Agility and breath hold time among The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of twenty men Basketball in each group. The groups were assigned as Experimental Groups I, II and control group respectively. Experimental group I was assigned as structured resistance training (SRT) and Experimental group II was assigned as weight training (WT) and control group. The control group was not given any special treatment except of their routine. Pre tests were conducted for all the subjects on selected agility, and breath holding time The experimental groups participated in their respective training protocols for a period of twelve weeks. The statistical significance of the differences were tested through ANCOVA. In all cases 0.05 level was fixed to test the hypothesis of this research.

Key Words: Agility & Breath holding time.

INTRODUCTION

Sports in the present world have become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and psychology etcetera. All the coaches, trainers, physical educational personals and doctors are doing their best to improve the performance of the players of their country. Athlete players of all the countries are also trying hard to bring laurels, medals for their countries in International competitions. (Bompa, 1999)

RESISTANCE TRAINING

Structured resistance training involves the application of elastic or hydraulic resistance to muscle contraction rather than gravity. Weight training provides the majority of the resistance at the beginning, initiation joint angle of the movement, when the muscle must overcome the inertia of the weight's mass. After this point the overall resistance alters depending on the angle of the joint. In comparison, hydraulic resistance provides a fixed amount of resistance throughout the range of motion, depending on the speed of the movement. Elastic resistance provides the greatest resistance at the end of the motion, when the elastic element is stretched to the greatest extent. (Arnheim, (1985)

WEIGHT TRAINING

Weight training is a very important aspect of sports training or physical body training and every body is aware of their effects on the body's muscles and tendons. Many researchers and analysts also believe that weight training with the right cardio exercises is known to reduce and control hypertension and supports the cardio vascular health functions of the body. The greatest benefit of weight training on the body is the creation of lean body mass, which helps burning calories.(Arnheim, (1985)

AGILITY

Agility is capacity to change direction quickly and to control movements. (Hardayal Singh, 1991).

BREATH HOLDING TIME

Breath holding time is defined as the duration of time through which one can hold his / her breath without inhaling and exhaling after a deep inhalation.

There are two types of breath hold time:

➢ Positive Breath holding time

➢ Negative Breath holding time

Endurance type of training will improve the breath holding time. Breath holding time also plays a vital role in the sports performance (P.J.Strukic, 1981).

STATEMENT OF THE PROBLEM

The purpose of the study was to investigate the effect structured resistance training and weight training on Agility and breath hold time among Basketball Players.

LIMITATION

Uncontrollable factors associated with the study were accepted as limitation and the following were considered as limitation of the research study:

1. Certain factors like rational habits like life style, daily routine, diet and climatic conditions were not taken into account in the study.

2. The influence of vigorous academic activity of students could have discouraged or motivated the subjects during training and during testing period.

3. The heterogeneous characters of the subjects in hereditary and environmental factors were recognized as a limitations.

4. The subject's body type and socio economic status of the students were not taken into consideration.

5. Uncontrollable changes in climate and whether conditions such as atmosphere, temperature, humidity and other meteorological factors during the training programme were regarded as limitations.

DELIMITATION

This research will be delimited to the following areas:

1. Sixty(n=60) men Basket ball players who had represented their colleges in intercollegiate level sports meets in Andhra Pradesh were selected for this study.

2. The age of subjects for the study between 19 to 25 years and all the subjects were good in health.

3. Experimental period will be 12 weeks.

4. To test the hypothesis the following parameters will be analysed.

Dependent Variables

1. Agility & Breath Holding Time

Independent Variables

1. Twelve Weeks Structured resistance training Exercises

2. Twelve Weeks Weight Training Exercises

EXPERIMENTAL DESIGN

The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of twenty men Basketball Players in each group. The groups were assigned as Experimental Groups I, II and control group respectively. Experimental group I was assigned as structured resistance training (SRT) and Experimental group II was assigned as varied weight training (VWT) and control group. The control group was not given any special treatment except of their routine. Pre tests

were conducted for all the subjects on selected agility, and breath holding time The experimental groups participated in their respective training protocols for a period of twelve weeks.

The post tests were conducted on the above said dependent variables after the experimental period of twelve weeks for all the three groups. The differences between the initial and final means on selected variables were considered. The obtained data were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed to test the hypothesis set for this study.

CRITERION MEASURES

The following criterion measures were adopted to measure the test.

1. To find out the agility of the subjects 6 x 10 M shuttle run test was conducted and scores were recorded in seconds.

2. To find out the breath holding time, nose clippings and the stop watch were used to record the time.

Table I

Intra Class Correlation Coefficient of Test – Retest Scores

S.No	Variables	Coefficient of Correlation
1	Agility	0.92*
2	Breath Holding time	0.86*

* Significant at 0.05 level

RESULTS ON AGILITY

The statistical analysis comparing the initial and final means of Agility due to structured resistance training and Varied Weight Training among Basket ball Players is presented in Table II

Table II
COMPUTATION OF ANALYSIS OF COVARIANCE OF AGILITY

	RESISTANCE TRAINING	WEIGHT TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	10.81	10.57	10.74	Between	0.61	2	0.31	1.45
				Within	12.00	57	0.21	
Post Test Mean	10.51	10.54	10.75	Between	0.74	2	0.37	1.68
				Within	12.51	57	0.22	
Adjusted Post Test Mean	10.42	10.66	10.73	Between	1.03	2	0.52	8.04*
				Within	3.60	56	0.06	
Mean Diff	-0.31	-0.03	0.01					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

As shown in Table II, the obtained pre test means on Agility on Structured resistance training group was 10.81, Varied Weight Training group was 10.57 was and control group was 10.74. The obtained pre test F value was 1.45 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Agility on Structured resistance training group was 10.51, Varied Weight Training group was 10.54 was and control group was 10.75. The obtained post test F value was 1.68 and the required table F value was 3.16, which proved that there was no significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 8.04 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented .

Figure I
BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON AGILITY
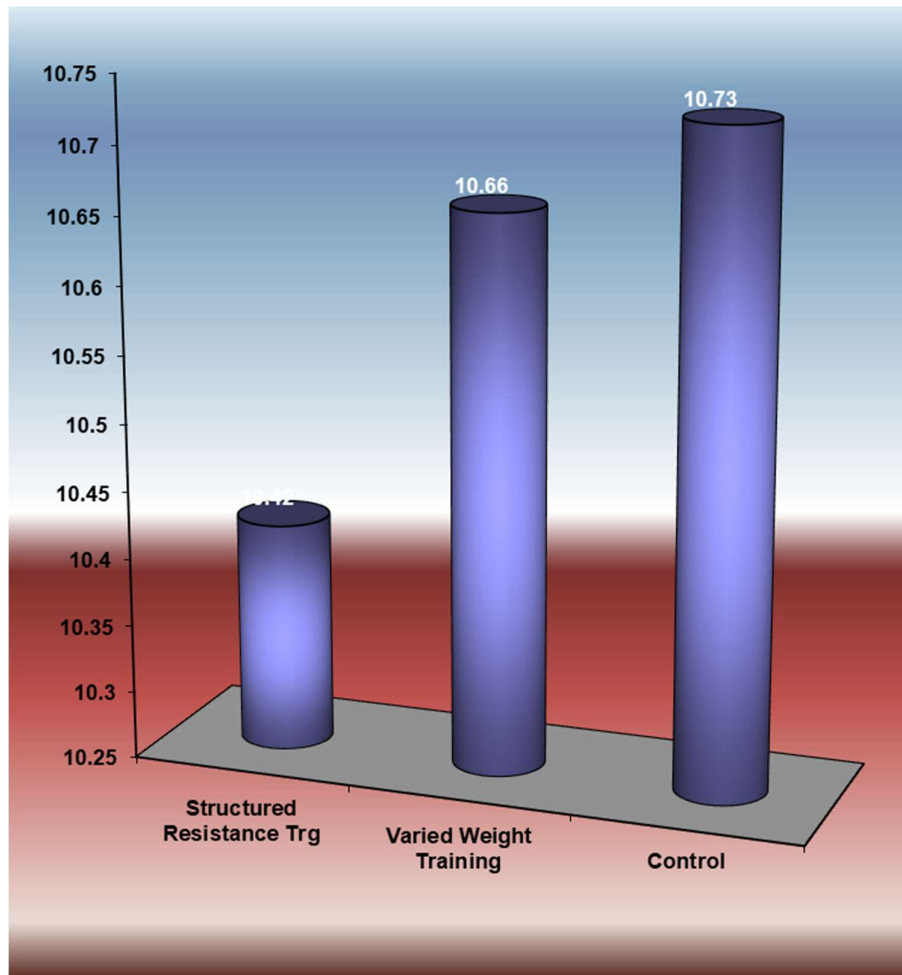
DISCUSSIONS ON FINDINGS ON AGILITY

The effect of Structured resistance training and Varied Weight Training on Agility is presented in Table II The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 8.04 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table proved that there was significant difference between Structured resistance training group and control group (MD: 0.31). There was no significant difference between Varied Weight Training group and control group (MD: 0.07). Comparing between the treatment groups, it was found that there was significant difference between structured resistance training and Varied Weight Training group among Basketball Players.

Thus, it was found that structured resistance training was significantly better than Varied Weight Training and control group in improving Agility of the Basketball Players.

RESULTS ON BREATH HOLDING TIME

The statistical analysis comparing the initial and final means of Breath Holding Time due to structured resistance training and Varied Weight Training among Basketball Players is presented in Table III

<div align="center">Table III</div>

COMPUTATION OF ANALYSIS OF COVARIANCE OF BREATH HOLDING TIME

	RESISTANCE TRAINING	WEIGHT TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	33.20	30.60	32.25	Between	69.23	2	34.62	0.85
				Within	2327.75	57	40.84	
Post Test Mean	36.75	33.20	32.75	Between	192.03	2	96.02	3.39*
				Within	1616.70	57	28.36	
Adjusted Post Test Mean	35.89	34.23	32.58	Between	108.96	2	54.48	8.06*
				Within	378.30	56	6.76	
Mean Diff	3.55	2.60	0.50					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

As shown in Table, the obtained pre test means on Breath Holding Time on Structured resistance training group was 33.20, Varied Weight Training group was 30.60 was and control group was 32.25. The obtained pre test F value was 0.85 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Breath Holding Time on Structured resistance training group was 36.75, Varied Weight Training group was 33.20 was and control group was 32.75. The obtained post test F value was 3.39 and the required table F value was 3.16, which proved that there was significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 8.06 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented

Figure II
BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON BREATH HOLDING TIME
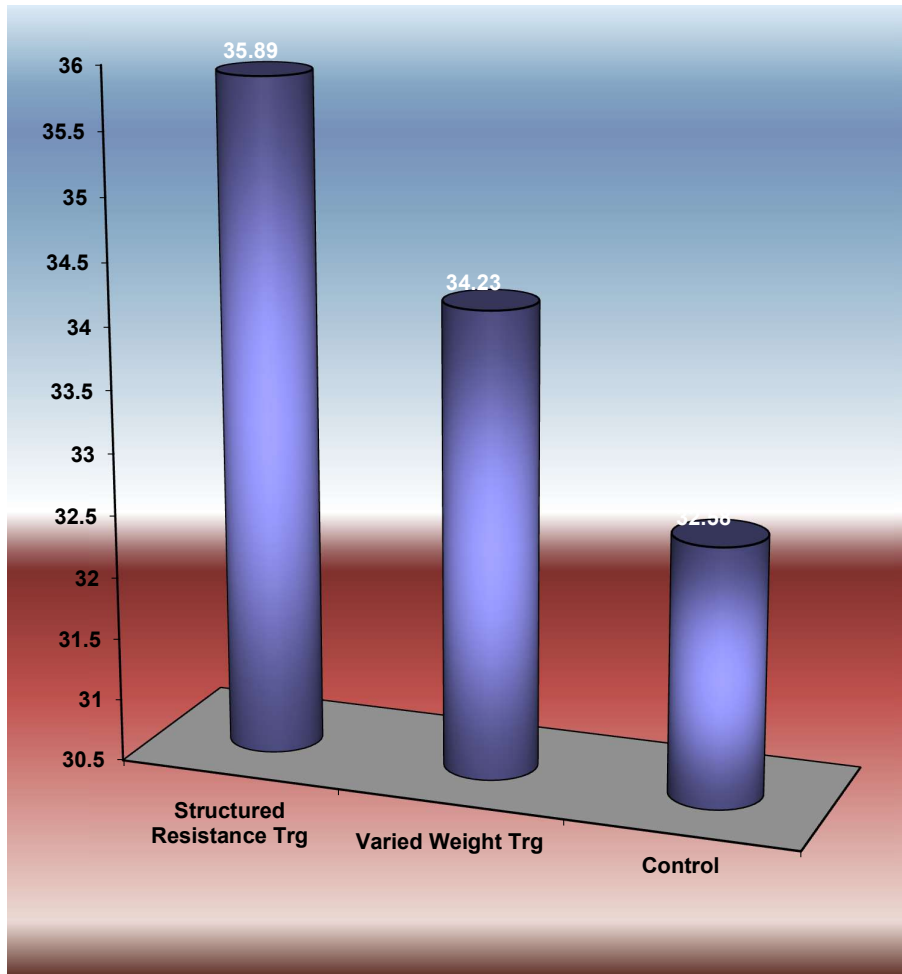
DISCUSSIONS ON FINDINGS ON BREATH HOLDING TIME

The effect of Structured resistance training and Weight Training on Breath Holding Time is presented in Table . The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 8.06 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table proved that there was significant difference between Structured resistance training group and control group (MD: 3.31). There was no significant difference between Varied Weight Training group and control group (MD: 1.65). Comparing

between the treatment groups, it was found that there was significant difference between Structured resistance training and Weight Training group among Basketball Players.

Thus, it was found that structured resistance training was significantly better than control group in improving Breath Holding Time of the Basketball Players.

CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn.

1. It was concluded that Structured resistance training and weight training exercises significantly improved agility of the college level Basketball Players. Comparing between the treatment groups, it was found that structured resistance training was better than varied weight training group.

2. It was concluded that structured resistance training significantly improved breath holding time of the college level Basketball Players. Comparing between the treatments groups, it was found that there was no significant difference between Structured resistance training and varied weight training group.

REFERENCES

Chow D, (2008) **Plyometric Exercises and Jumping Power**, University, Jahad Press.

Enoka RM. (2002) **Neuromechanics of human movement**. 3rd ed. Champaign, IL: Human Kinetics; 2002

Gordon Jackson, (1985) **A Family Guide to Fitness Exercise,** London: Salamander Book Limited, P.102.

Hardayal Singh S. (1984), **Sports Training and Coaching**, Patiala: Nethaji Subash National Institute of Sports Publications, P..3.

Hardayal Singh, (1984). **Sports Training: General Theory and Method** (Patiala: Netaji Subas National Institute of Sports), p. 148.

Hardayal Singh. (1991), **Science of Sports Training**, New Delhi: D.V.S. Publications P. 13

Harold M. Barrow and Rose Mary Mc Gee, (1979) **A practical approach to measurement in physical education** (2nd cell) Philadelphia: Lea and Febiger, P.25

Harold Shrylock M. D. Huber O. Swartout, (1979) **Skills in Basketball,** Pacific press publishing association,.P:378-379.

Harold Shryock. M.D, Huber O. Swartout, (1970) **You and your health,** Volume 1, Pacific press publishing association, P. 377.

Harrison H. Clarke and Davil H.Clarke, (1978) **Application of measurement to physical education,** Englewood Cliffs, N. J. Prentice hall, Inc, P.243, 244,315.

Adams, K., O'Shea, J.P., O'Shea, K.L. and Climstein, M (1992) "The effect of six weeks of squat, plyometric and squat-plyometric training on power production." **Journal of Strength and Conditioning Research** 6, 36-41.

Anderson, T., & Kearney, J. T. (1982). "Effects of three structured resistance training programs on muscular strength and absolute and relative endurance." **Research Quarterly for Exercise and Sport**, 53, 1-7.

Avery D. Faigenbaum, James E. McFarland, Fred B. Keiper, William Tevlin, Nicholas A. Ratamess, Jie Kang and Jay R. Hoffman (2007), "Effects of a short-term plyometric and resistance training program on fitness performance in boys age 12 to 15 years", **Journal of Sports Science and Medicine** 6, 519-525.

Baechle, T.R. and Earle, R.W. (2000) **Essentials of strength training and conditioning**. 2nd edition. Champaign, IL: National Strength and Conditioning Association.

Besier TF, Lloyd DG, Cochrane JL, Ackland TR. (2001) "External loading of the knee joint during running and cutting maneuvers". **Med Sci Sports Exerc** 33(7):1168-75.

Bonacci, et. al., (2009)**, "**Neuromuscular adaptations to training, injury, and passive Interventions", **Sports Med** 39 (1) 908-921.

Burnham TR, Ruud JD, McGowan R. (2010) "Bench press training program with attached chains for female volleyball and basketball athletes." **Percept Mot Skills**. 110(1):61-8.

Campo S, Vaeyens R, Philippaerts RM, Redondo JC, de Benito AM, Cuadrado G. (2009) "Effects of lower-limb plyometric training on body composition, explosive strength, and kicking speed in female soccer players". **Journal of Strength Conditioning Res.** 23(6):1714-22.

Carpinett, R.N (*2003*) "The *Effect* of *Varied Weight Training Programmes* on. *Strength*" **J Strength Cond Res.** Nov;17(4):409-15.

Chetna Chaudhary and Birendra Jhajharia, (2010) "Effects of plyometric exercises on selected motor abilities of university level female basketball players," **British Journal of Sports Medicine**, 44:i23.

Christopher C. Michal Lehnert, Ivona Lamrova, Milan Elfmark, (2009) "Changes in speed and strength in female volleyball players during and after a plyometric training programme", **Acta Univ. Palacki. Olomuc., Gymn**. 39, 1.